

APR - JUN/1988

# Capsule 9

## GROWTH OF A SCIENCE CENTRE



Dr. J C Bhattacharya, Director, Indian Institute of Astro-Physics in Bangalore, inaugurated the gallery.

(below)—Dr. Bhattacharya interacting with exhibits.

### DISTRICT SCIENCE CENTRE GULBARGA ADDS A NEW POPULAR SCIENCE GALLERY

A tribute to people's growing science-consciousness and their demand, a new Popular Science Gallery has been opened at the District Science Centre in Gulbarga, on 30 March, 1988.

An array of fascinating exhibits are there, all hands-on, that offer to the visitors scope to explore into various aspects of everyday science and their own perception. Here emphasis has been laid on understanding *light and vision*. Exhibits on reflection and refraction of light, principles of the working of prism and different types of lenses, pinhole magnification and so on, explain and elucidate the phenomenon of *light*. Here, by manipulating exhibits, one can understand that *light, object and vision* are interdependent: *light or vision* has no separate entity without *object*. Here, exhibits range



from such simple phenomena to rather complex polarisation of light. Here one can play with light and colour and discover the underlying principles of various happenings around. Exhibits also reveal the areas of mathematics through fun.

The new gallery contains a lot more fun and learning. Interaction with the assortment of exhibits gives people a never-before understanding into things.

## NCSM SPEAKS

With this issue, CAPSULE steps into its third year of existence. Over this span of time its readership has increased twofold, both in India and abroad. Innumerable letters from various people and organisations from all over the world requesting for CAPSULE are continuously flowing in; and it may naturally be taken as a direct index of its popularity. We have sufficient reasons to believe that CAPSULE fills, to a great extent, the gap in science-communication, particularly in India.

Incidentally, we recently received a letter from Mr. Robert Jullien, Director of the Bureau for Museographical Co-operation and Information Exchange, Paris, seeking permission to reproduce the cartoon from the 7th issue of CAPSULE. The cartoon is based on the theme of ecological disaster resulting from indiscriminate industrialization and deforestation, and it is good to see the universal appeal of it so recognized. Indeed, we were only happy to grant the permission for its reproduction.

In this context, we reiterate our appeal to all likeminded organisations and individuals engaged in the task of science communication in India and abroad, for contribution of their ideas and experiences to CAPSULE. CAPSULE assures room for all.

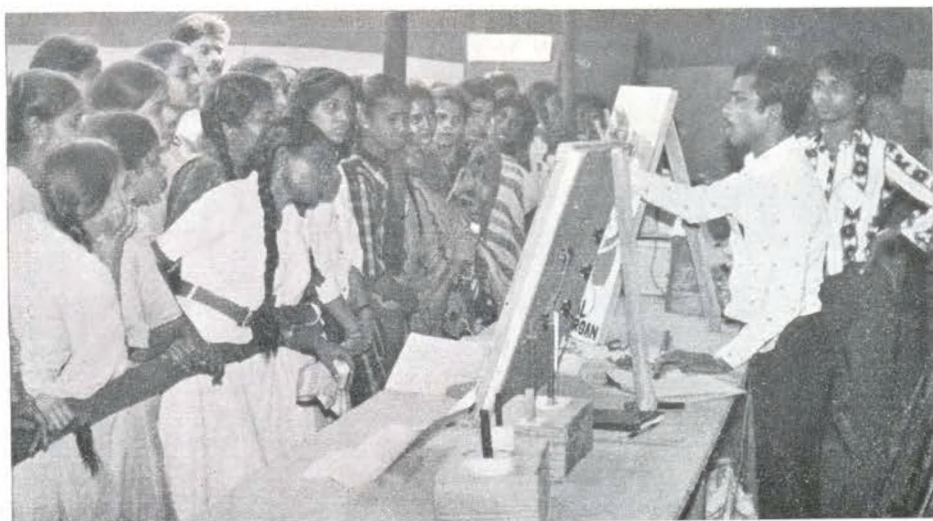
## REGIONAL SCIENCE FAIRS AND CAMPS meet of budding scientists

Thousands of school students along with their teachers and science-buffs from science clubs across the country take part in this annual NCSM programme. These fairs and camps have a multi-tier system: starting at district level, going up to state level and then culminating at the regional level. Budding scientists from nooks and corners of the country assemble in these fairs at grass-root level with their various ingenious working models and projects, and compete to rise through successively higher levels. Various study-scholarships, prizes, special awards and trophies are there, to enthuse the winners.

This programme of science fairs and camps is, in a sense, the culmination of NCSM science museums' other non-formal educational programmes. Schemes like *creative ability centre* or *hobby centre* and *science demonstration lecture* whet up the ingrained curiosity in the youngsters, lead them to exploration into ideas and giving three-dimensional shapes to them. Precisely that is how, many models and exhibits that assemble in these fairs, come into being.

Science Fair had a modest start in 1967, with participants from schools in Calcutta only. In May 1969, during the tenth anniversary of Birla Industrial & Technological Museum, *All Bengal Science Fair* was organised. In 1975 this annual event of BITM was given a new dimension by inclusion of the Eastern Indian States and by renaming it *Eastern India Science Camp*. Nature of the fair also had a transition—from a mere display and demonstration of models to work-oriented teaching camp where students from less privileged regions are exposed to hands-on experiments, under guidance of experts in different disciplines of science.

*Southern India Science Fair*, organised by Visvesvaraya Industrial & Technological Museum in Bangalore also developed in the same way. With the establishment of the National Science Centre in



*West Bengal State Level Science Fair — 1988.*

Delhi, the vast Northern region of India will also be brought under this programme.

This year *West Bengal State Science Fair* was held in BITM premises during 7-10 February, 1988. 200 prize-winning models and exhibits on science technology from district science fairs were displayed and demonstrated.

This year, hosted by the Government of Bihar, the *Eastern India Science Camp* was held in Patna during 13-17 February. 200 participants from 122 schools and 20

science clubs with 150 models assembled there, to mark their creative abilities. Exposure-oriented training camps on photography, electronics, life-sciences, utilization of waste materials, computer-literacy and creative activities were organised for observers coming from all over Eastern India.

In the Southern region of India, *Karnataka State Level Science Fair* was held at Dharwad, during 12-15 December, 1987. Eightythree schools took part, with two students, one teacher and three projects from each school. This four-day Fair attracted over 10,000 visitors.



*Eastern India Science Camp — 1988.*

## FIRST ANNIVERSARY OF DISTRICT SCIENCE CENTRE, TIRUNELVELI

On 27 February, 1987 the Centre was formally inaugurated, and within this span of time it has been able to draw people of all strata into its varied educational programmes. Apart from the round-the-year activities, the Centre's first anniversary week celebration programme comprised many such events: on 24 & 25 February took place science quiz and elocution contest, involving a large number of school students. On 27 February was inaugurated an educative exhibition on Ramanujan, the mathematical prodigy of India. Along with the exhibition there were many popular lectures on Ramanujan by eminent mathematicians and scientists. On 28 February was celebrated the 2nd National Science Day with science march and popular lecture on C. V. Raman.

Among the Centre's programmes for school students during February, the CAC hobby activity on chemistry and the workshop on simple printing techniques deserve special mention.



Bakery Demonstration (above) and Workshop on 'Tie & Dying' (below)—at District Science Centre, Tirunelveli.



## SHRIKRISHNA SCIENCE CENTRE, PATNA

Dr. Shrikrishna Sinha, the first Chief Minister of Bihar was a man of vision and scientific outlook, and the Science Centre in Patna is named after him, as a mark of homage to his memory.

On 31 January, 1988, on the occasion of the death anniversary of Dr. Sinha, a prayer meeting was arranged at the Centre in which a large number of people took part. Many people visited the galleries of the Centre and film-shows were arranged for their viewing.

## INDIRA GANDHI PRIZE FOR POPULARIZATION OF SCIENCE

Dr. Saroj Ghose, Director General of the National Council of Science Museums has been awarded the 1988 Prize by the *Indian National Science Academy* (INSA).

For three decades Dr. Ghose has been devoted to the cause of science-popularization. For 15 years he headed Birla Industrial & Technological Museum in Calcutta and then, Nehru Science Centre in Bombay. With him as the head of the National Council of Science Museums, Science Museum Movement in India was consolidated and given a boost. Under his leadership a comprehensive strategy was devised to establish a chain of science museums and centres across the country. Science museums in India are quite renowned throughout the world for their innovative interactive exhibits, extensive educational activities and outreach programmes. Their *science park* is a unique concept in disseminating science education in non-formal way.

Dr. Ghose conceptualized the large science-technology exhibition that travelled through the USA for over two years. He had also been instrumental in developing a large section of the S & T exhibition which travelled in USSR as a part of the Festival of India celebration there. A believer in international collaboration, Dr. Ghose has always

a catalytic role to play in the international exchanges of ideas and exhibits.

## MICRO-ROBOT MICRO COMPUTER INTERFACE

A new dimension in robotics was achieved at the Central Research & Training Laboratory of NCSM when a microcomputer (*SCL Unicorn, made in India*) was successfully interfaced with a microrobot (*Teach Mover, manufactured in the USA*), and installed in the Electronics Gallery of Birla Industrial & Technological Museum in Calcutta, as a permanent exhibit. Presently experimentation is going on regarding introduction of robot in a bigger way in the science museums in India.

A paper containing the technicalities of this interfacing was presented at the International Symposium on Electronic Devices, Circuits and Systems (ISELDECS—87), held at the Indian Institute of Technology, Kharagpur, during 16-18 December, 1987. The paper was well-received in the Symposium.

## BIHAR STATE INSTITUTIONAL SCIENCE EXHIBITION—'88

Rohini Science Club, Ranchi, organised this exhibition which was held during 21-24 January at the Zila School Campus, Ranchi.

About 85 selected models were displayed and demonstrated by over 100 young participants from 27 schools, colleges and science clubs in various parts of Bihar. Exposure-camps on many science topics and cultural programmes were also parts of the exhibition.



Dr. N K Sehgal, Director of National Council for Science & Technology Communication, at the exhibition.

Indo-US Workshop on  
**Ellipses in Nature and in the Mind**  
India, 9-15 May 1988  
National Council of Science  
Museums and Indo-US Sub-  
Commission on Education &  
Culture.

\*

International Workshop on  
**Science Museums Without  
Walls-exhibits to go**  
5-13 December 1988  
Delhi, Bombay, Bangalore,  
Calcutta.  
Organised by  
National Council of Science  
Museums in collaboration with  
UNESCO, ICOM and Indo-US  
Sub-Commission on Education &  
Culture.

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**Museum Management  
Programme**  
by Dr. Victor J Danilov  
4-8 and 11-15 July, 1988  
University of Colorado, USA.

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**Health Week**  
Tirunelveli, 15-21 February, 1988  
District Science Centre, Tirunelveli.

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Workshop on  
**Energy Conservation and  
Management**  
Calcutta, 25-26 March, 1988.  
The School of Energy Studies,  
Jadavpur University, Calcutta.

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Workshop on  
**Environment Leadership**  
Calcutta, 4 May 1988.  
Science Association of Bengal,  
Calcutta.

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International Conference on  
**Cryogenics (INCONCRYO-88)**  
Calcutta, December 1988.  
Indian Cryogenics Council,  
Calcutta.

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Symposium on  
**Industries and Informatics**  
Bombay, 26-30 September, 1988  
National Institute for Training  
in Industrial Engineering, Bombay.



## JUMPING DISC

Each coil at the bottom acts as primary and the aluminium bobbin as secondary of a transformer. Centrally placed wires in a bunch act as the common core for both the coils. When the coil on which the bobbin is placed is energised by pressing a switch, the upper end of the coil and the lower end of the bobbin become

of same polarity, and the bobbin springs to the other end of the arch. When the other switch is pressed, the same action takes place and the bobbin springs back to its original position. By pressing the two switches alternately in quick succession, the bobbin can be shuttled to and fro endlessly, and it is great fun.

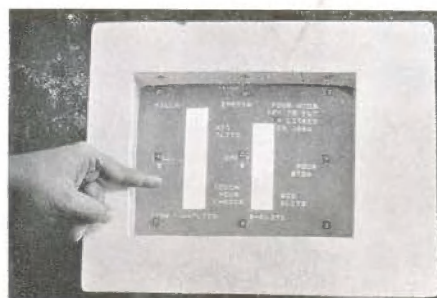
## TOUCH SCREEN

An interactive, touch-sensitive screen has been designed and developed at the *Central Research & Training Laboratory (CRTL)* of NCSM. With the introduction of this system, computer's keyboard can be dispensed

with, as the visitor gets the necessary information just by touching with the finger certain points marked on the screen.

The unique feature of this system is its potentiality in drastically reducing the cost of production of interactive video exhibits, along with offering to the visitors scope for participation in a greater degree.

The complete system consists of a standard monitor, a small interface board and a 8085 Central Processing Unit (C.P.U.) with a memory of 8 K which has also in-built facilities for graphics and alpha numerals.



# countrywide celebration of the NATIONAL SCIENCE DAY

February 28, 1988. In recognition of the social role of science, Govt. of India since last year decided to observe the day as *National Science Day*. On this day in 1928, Professor C V Raman announced his *Raman Effect* for which he was awarded the Nobel Prize, the first in science in Asia.

All the Science Museums and Centres under NCSM across the country celebrated the Day, as in the previous year, in a well-co-ordinated way, through elaborately planned programmes, with spontaneous involvement of thousands of school children, teachers, enthusiasts from science clubs, common people, eminent scientists and educationists of their respective regions. Every Museum or Centre organised colourful *Science March* in which thousands of people took part with banners, festoons and posters carrying various appropriate messages of science. Songs were sung, mobile dramas were performed and the processions at their culmination were addressed by eminent scientists and educationists. In-house programmes in the afternoon and throughout the night comprised science drama, poetry, sit & draw, sit & write, show & tell, and quiz contests, sky observations, planetarium shows, workshop on astronomy and other topics, science film, video and slide shows, popular lectures and many such events. Many people visited the galleries and science parks too, which were kept open throughout the night.



(above) Science Quiz Contest, involving young people. There were many a programme like this at all the science museums and centres under NCSM all over the country.



(right) Youngsters at a science park exhibit. Everywhere, it was a nice day for the people to explore exhibits at the science park and indoor galleries.



Dr. Neu Cossons, Director of the Science Museum in London (third from right) joined in the programmes at Calcutta, when his tour programme happily coincided with the occasion.



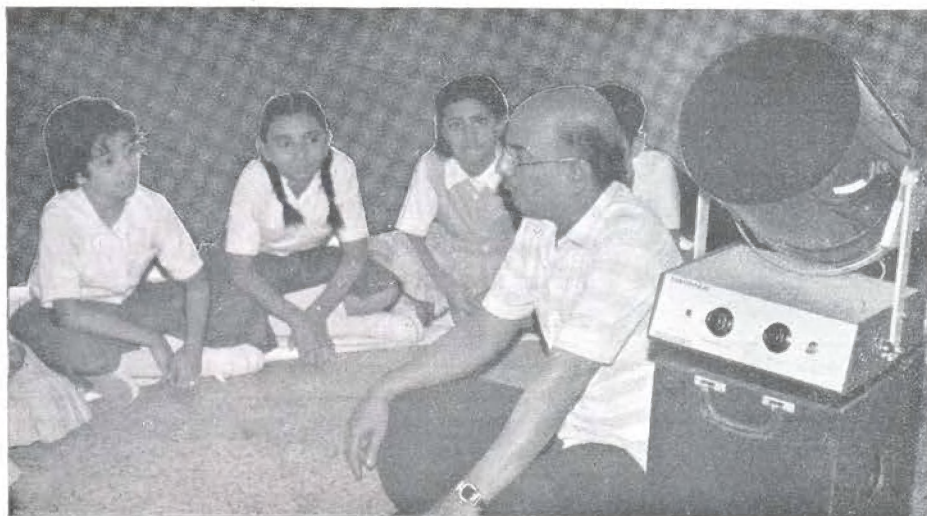
Science March, Calcutta.



Science March, Patna.

## PORTABLE PLANETARIUM - first time in India

It is a planetarium, and an altogether new kind of planetarium too, in India. It is completely different from the conventional masonry dome, housing a massive and sophisticated projector. It is portable: the dome, weighing only about 30 kg, is made of special light-proof, air-proof and fire-retardant polymer fabric. When inflated by a blower fan operating on 230 volt/50 Hz A.C., it takes the shape of a hemispherical dome in 5-10 minutes, attaining a height of 3.2 m., and a diameter of 4.9 m. For its operation it is required to be housed in a room having a floor space of 7.6 m x 7 m and a ceiling height of 3.4 m. The tiny projector which operates inside



*TARAMANDAL offers real instructor — audience interaction.*



*Children entering into the Dome.*

the dome for projection also works on 230 volts/50Hz A.C. mains supply. It is adjustable for any time, season and location in the Northern Hemisphere. Projection cylinder, namely Northern Star Field Cylinder, can be easily fitted to the projector for projection of about 3,000 stars and 48 constellations. The star cylinder has attachments for projection of Mercury, Venus, Mars, Jupiter and Saturn. All equipment and accessories are suitably packed in handy casings, making it possible to become mobile in nature. So naturally, people need not come to it, rather it goes to people. Any time, anywhere, in any part of the country. Besides the use as a planetarium this versatile dome can be used for audio-visual presentations, portable theatre, photographic darkroom, experiments on light or for any other purpose requiring a darkroom. The cost is too insignificant in comparison to that of the conventional masonry one.

### ADDITIONAL FEATURES

- \* No architectural changes to existing room is needed. construction assures long, trouble-free use.
- \* It is very easy to operate. It requires no additional staff and can be used by any one. No special expertise or skill is necessary.
- \* Although not as versatile as a conventional planetarium, this system has an edge over it in terms of close instructor-audience interaction, as its capacity is only 20 adults or 30 children.
- \* It has very little upkeep cost. It requires no expensive annual maintenance contract and its

*(Contd. in Page 8)*



*Exit through the sleeve, after a wonderful experience with stars.*

## MEETING OF THE JOINT COMMITTEE ON CULTURAL HERITAGE & ENDEAVOUR

The Joint Museums Committee was so named at the meeting of the Indo-US Sub-Commission on Education & Culture in March 1987, to reflect the expanded pervue of the Committee's activities. Along with the Committee's commitment to the ongoing work in fields such as science centres, natural history, art museums and conservation, now there is a commitment to expand into new areas like libraries, archives, performing arts, crafts etc.

The 13th meeting of the Joint Committee was held at Los Angeles during 4-5 February, 1988, for formulating a host of collaborative activities between India and the USA, some of which are directly related to science centres.

## WORKSHOP ON THE DEVELOPMENT OF EXHIBITS AND ACTIVITIES

It was decided to organise a Workshop on *Ellipses in Nature and in the Mind* in India for one week in May, 1988. The objective of the Workshop is development of new exhibit concepts and designs which are to be incorporated in a small exhibition on the subject, appropriate to both the countries. The Workshop will include the participation of six American and 15 Indian experts, drawn from the fields of arts, science and philosophy.

## INTERNATIONAL CONFERENCE ON MUSEUMS WITHOUT WALLS—EXHIBITS TO GO

With the objective of developing an elaborate manual for conducting outreach programmes by science museums and centres, developed, under development or under planning as they may be, and located anywhere in the world, NCSM is organising an international workshop in India during

5-13 December, 1988. Organisations like UNESCO, ICOM and Indo-US Sub-Commission on Education & Culture are collaborating with NCSM in this project, in which about 60 museum educators engaged in conducting outreach programmes in different parts of the world will participate. The document shall be prepared through active interaction of the participants, assimilating their experiences and examining the prospect of designing new programmes and ways of implementing them effectively.

Exhibit, activity and presentation are the major aspects of any outreach programme. Complementary in nature as they are, a lot of research needs to be put in, to make them homogeneous, for the greatest degree of effectiveness. Hence, development of appropriate, custom-built exhibits and kits that will go out and be used in conjunction with a suitable presentation in such programmes, will be emphasized in this workshop.

## EXHIBITION ON STRUCTURES

Structures, the hands-on exhibition on engineering principles is scheduled to come to India by the end of 1988. Developed by Franklin Institute in Philadelphia, the exhibition will be constructed in the U.S., but an important feature of its showing in India is that the American designers will work with NCSM designers to adapt the exhibition to make it more relevant to the Indian audience.

## 25 YEARS OF SPACE PHOTOGRAPHY CONTINUES TOURING INDIA

The exhibition of planetary photographs came to India from the USA in November, 1986 and over a year it was displayed at seven NCSM units all over the country. The immense popularity of the exhibition led the American authorities to deliver the exhibition for good to NCSM, for coordinating further shows. NCSM chalked out a two-year programme for the exhibition at fourteen places across



Smt. Kumudben Joshi, the Governor of Andhra Pradesh, inaugurated the exhibition at Hyderabad.

the country, and at the first leg, the exhibition was opened at BM Birla Planetarium in Hyderabad on 27 December, 1987. During 21-23 December an International Seminar on Ancient Astronomy was held at the Planetarium and Prime Minister Shri Rajiv Gandhi, attending a special session of the Seminar on 22 December also visited the exhibition. Dr. Saroj Ghose, the Director General of NCSM presented him with a photograph of Uranus.

The exhibition was over at Hyderabad on 31 January, 1988, attracting near about 100,000 visitors. Then it was opened at the Municipal Planetarium in Warangal.

## NCSM'S EXHIBITIONS ABROAD

The massive science-technology exhibition by the Dept. of Science & Technology, Govt. of India, in which NCSM took part in a big way (NCSM conceptualized and fabricated a major segment of the large exhibition) has come to a



The Soviet people eagerly queuing for the exhibition.

(Contd. in Page 8)

## PORTABLE PLANETARIUM

(Contd. from Page 6)

NCSM, with its innovative approach towards people's non-formal science education, has recently introduced this portable planetarium titled "Taramandal" in India in collaboration with Learning Technologies Inc. Massachusetts, USA, in a modified form to suit Indian requirements and condition. About 95% components and accessories used in this system have been indigenously developed. Except the cylinder and the projection lamp, all gadgets are of Indian origin. 25 initial copies have already been fabricated at 1/3rd cost of the US version.

These planetaria are already in action in various parts of the country. In December 1987 the first one was inaugurated at the District Science Centre in Purulia. Apart from the NCSM units, many a organisation like Vikram A Sarabhai Community Science Centre in Ahmedabad and North Eastern Hill University in Shillong have obtained this system from NCSM at actual cost. NCSM provides free training for such users, and all spares are also available with NCSM.

## EXHIBITIONS ABROAD

(Contd. from Page 7)

close in USSR. As part of the Festival of India celebration there, the exhibition was successfully held at Leningrad, Moscow and Tashkent during 20 August, 1987 — 25 February, 1988. Everywhere the exhibition gained enormous popularity, in terms of visitors' flow and media-coverage.

India — a Festival of Science Exhibition, after its 2 year-long travel in the USA, has come back to India. The exhibits are now being remodelled to create a new gallery named *Heritage of India* at Nehru Science Centre, Bombay. A smaller version of the exhibition was retained by the ASTC (Association of Science-Technology Centres, USA) in order to accommodate the needs of smaller museums. This new version of the exhibition was opened at the Detroit Science Centre in December, 1987. The exhibition is scheduled to be featured further at the *Science Place in Dallas*, the *Science Museum of Connecticut*, the *Midland Centre for the Arts in Michigan* and the *Kalamaroo Public Museum, Michigan*.



The new science park attracts a great response from the visitors.

Coaster, Tilt and Turn, Friction Slide, Thermal Tubes, Fluid Dynamics, Giant Lever, Wind Harp, Speed of Sound, and Pitch Pipes.

New York Hall of Science and Pacific Science Centre, Seattle, are also slated to have Science Parks soon.

## THE NEXT ....

Birla Industrial & Technological Museum in Calcutta has fully commissioned a fascinating new Childrens Science Gallery, which will be inaugurated in May 1988.

CAPSULE — 10 will give you the details.

## SCIENCE PARK IN THE USA

In contrast to its nascence in the USA, science parks have long been a common and popular feature of science museums and centres in India. Hence, considering the positive impact of science parks in children's non-formal science education and to tap the Indian expertise in the field, an Indo-US workshop under Indo-US Sub-Commission on Education & Culture Programme was held at St. Louis during 27-29 April, 1987. In the Workshop NCSM presented one of its publications — a catalogue of science park exhibits, which was well-received by the American science museums and centres.

Now, a science park, complete with 24 sturdy, outdoor exhibits, and a working weather station has come into being at St. Louis Science Centre. Exhibits include *Giant Marble Kaleidoscope*, *Human Kaleidoscope*, *Giant Walk-through Colour Maze*, *Gears and Gizmos*, *Spiral Race*, *Gravity Circle*, *Roller*

## FUTURISTIC !



## WE NEED ....

EDITOR CAPSULE is looking forward to your sending by April 30, 1988, publication materials for the Tenth Issue of CAPSULE. Please send short notes, photographs, problems, suggestions, cartoons and puzzles.



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